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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/560,848

12/15/2005

Gijbertus Franciscus Roovers

SPIN1

2105

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EXAMINER

IRVIN, THOMAS W

ART UNIT

PAPER NUMBER

3657

NOTIFICATION DATE

DELIVERY MODE

04/21/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/560,848	<b>Applicant(s)</b> ROOVERS ET AL.
	<b>Examiner</b> THOMAS IRVIN	<b>Art Unit</b> 3657

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 February 2011.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 December 2005 and 24 December 2008 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| <p>1) <input type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br/>    Paper No(s)/Mail Date _____.</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)<br/>    Paper No(s)/Mail Date. _____.</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application</p> <p>6) <input type="checkbox"/> Other: _____.</p> |
|---|--|

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore,

- a) the rotatable wheel having convex contact faces with a varying curvature, and
- b) the rotatable wheel having convex contact faces having a radius of curvature larger than the radius of the wheel

must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

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the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In dependent claim 2 recites that the force sensor is a rotatable wheel located between the drive wheel and driven wheel (see figs. 1, 2, 4a, and 5), while dependent claims 8 and 9 both recite that the wheel has two convex contact faces (11,12) with a curvature different from that of a rotatable wheel (see fig. 3). Claims 8 and 9 are therefore indefinite because the structure claimed conflicts with the structure recited in claim 2.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-7, 10-17, 19-24, 26-30, and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko et al. (4,909,086) in view of Searle (GB2312193).

In Re claims 2 and 26, Kaneko et al. disclose a transmission system (fig. 1), comprising: a drive wheel (2), a driven wheel (3), and a coupling belt (4) having a first belt half (upper) and a second chain half (lower); a tension difference measuring device comprising a transverse force sensor (16) and sensor wheels (11,12) arranged within the span of the chain, provided with measuring means for providing an electric measurement signal that is proportional to the forces exerted to the sensor by the chain parts. Kaneko et al. fail to teach the specifics of the force sensor and the chain.

Searle teaches, with reference to fig. 1, a chain transmission transverse force sensor (C) arranged between the drive wheel (B1) and the driven wheel (B2), and having a first contact face (top half, see arrow) touching the first chain half at an inner side of the chain, and a second contact face (bottom half) touching the second chain half at an inner side of the chain. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the transverse force sensor of Kaneko et al. to have a single wheel located between the drive wheels, as taught by Searle, in order to provide a compact structure for supporting the sensor and measuring the resultant transverse forces produced. The examiner also notes that it would have been obvious to replace the belt transmission with a chain transmission, as a chain and sprockets are far less likely to slip, and can impart more torque.

In Re claims 3, 5-7, and 11-13, the examiner understands the system to include a supporting arm (14) holding the sensor, which measures a vertical deformation of the supporting arm, holding the sensing wheel.

In Re claim 4, see fig. 1 of Searle.

In Re claim 10, said measuring means measure a displacement of the sensing wheels (see fig. 1 of Kaneko et al.).

In Re claim 14, see fig. 1 of Kaneko et al.

In Re claim 15, Kaneko et al. as modified, further teach that the support arm is fixed to a stationary body (15), but fail to teach the support arm being fixed to the wheel axle of one of the drive or driven wheel, however, it would have been obvious, given the shape and location of the supports and sensor wheel, to have attached the fixed length support arm (14) to one of the axles of the drive or driven wheels, in order to reduce packaging space and utilize existing support mounts.

In Re claims 16 and 35, see strain gauges (16) of Kaneko et al.

In re claims 17 and 32, Kaneko et al. as modified, fail to disclose a sound production counteracting material. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the sensor wheels to be manufactured of a sound production counteracting material as a matter of simple engineering design choice to quiet the transmission. Also note MPEP Section 2144.07, which states that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination.

In Re claims 19, 20, 33, and 34, Searle further teach utilizing a transverse force sensor arrangement on a bicycle, which is powered by a human force.

In Re claim 21, given the structure of the transmission system of Kaneko et al, as modified, as described above, the method steps would be inherently performed during normal operation of the device.

In Re claims 22-24, the examiner understands the system to include a supporting arm (14) holding the sensor, which measures a vertical deformation of the supporting arm, holding the sensing wheel.

In Re claims 27 and 28, the examiner understands the system to include a supporting arm (14) holding the sensor, which measures a vertical deformation of the supporting arm, holding the sensing wheel.

In Re claim 29, see fig. 1 of Searle.

In Re claim 30, Kaneko et al as modified, teach the claimed invention except an elongated hole for mounting the transverse force sensor. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included an elongated hole in the support arm to allow for adjustment of the mounting location of the transverse force sensor, since it has been held that the provision of adjustability, where needed, involves only routine skill in the art. In re *Stevens*, 101 USPQ 284.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko et al. (4,909,086) in view of Searle (GB2312193) as applied to claims 2 and 10 above, and further in view of Todd et al. (2003/0087713).

In Re claims 8 and 9, Kaneko et al. as modified, fail to teach two convex surfaces in contact with the chain.

Todd et al. teach using, in a chain transmission, a shoe (30) engaging the chain (16) to measure tension on the chain. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced the sensor wheel of Kaneko et al. as modified, for two convex shoes, as taught by Todd et al., in order to increase the contact with the chain, and thus the sensitivity to actual tension imparted by the rider, and not unintentional vibration.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko et al. (4,909,086) in view of Searle (GB2312193) as applied to claim 22, and further in view of Roovers et al. (WO 0130643).

In Re claim 25, Kaneko et al. as modified, fail to disclose a sensor on a bearing of the sensor wheel.

Roovers et al. teach a transverse force sensor (74) rotatably mounted in a bearing (70), wherein the sensor measures the forces caused in the bearing by the chain force (abstract) (p. 25 line 33 – 7 and fig. 9A). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the transmission system of Kaneko et al., as modified, to include a bearing mounted force sensor, as taught by Roovers et al., to more accurately measure the reaction forces caused by the chain tension imparted by the drive wheel, and decrease the likelihood of unintentionally measuring related chain vibrations.



Claims 31 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko et al. (4,909,086) in view of Searle (GB2312193) as applied to claim 27 above, and further in view of Nicolau (3,832,899).

In Re claim 31, Kaneko et al. as modified, fail to disclose specifics of the support arm.

Nicolau teaches a dynamometrical deflection measuring device having a two-part primary/secondary support arm (5,6), understood to meet the limitations of a cut-away, wherein one of the support arms includes at least two bridge parts, understood to be the mounting points. A sensor (7) is mounted on a side of one of the support arm bridge parts. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission device of Searle to include the support arrangement taught by Nicolau, in order to provide a compact structure for supporting the sensor wheel.

In Re claim 36, see strain gauges (16) of Kaneko et al.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko et al. (4,909,086) in view of Hordnes et al. (5,445,036).

Kaneko et al. disclose a transmission system comprising: a drive wheel (2), a driven wheel (3), and a belt (4), a tension difference measuring device comprising a transverse force sensor (11,12), with measuring means (16) for providing an electric

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signal that is proportional to a transverse force component. Kaneko et al. fail to teach that the sensor is one of the drive or driven wheels.

Hordnes et al. teach a torque sensor with the concept of having a transverse force sensor being one of the drive or driven wheels (see Fig. 1), and wherein the measuring means (36) is adapted for measuring the force exerted to the wheel concerned in a direction substantially perpendicular to the plane defined by the rotation axes of the drive wheel and the driven wheel (col.3, lines 39-47). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the transverse force measuring system of Kaneko et al. to be included in one of the wheels, as taught by Hordnes et al., in order to provide a more compact structure for measuring the torque and tension difference in the drive system. The examiner also notes that it would have been obvious to replace the belt transmission with a chain transmission, as a chain and sprockets are far less likely to slip, and can impart more torque.

### ***Response to Arguments***

Applicant's arguments filed 09 February 2011 have been fully considered but they are not persuasive.

In response to applicant's arguments that the reference fail to teach a rotatable sensing wheel, the examiner points to fig. 1 of Kaneko et al, fig. 1 of Searle, and figs. 1-3 of Hordnes et al..

In response to applicant's arguments that the references fail to teach that the force sensor is arranged within the span of the chain, the examiner points to fig. 1 of Searle.

In response to applicant's arguments that the references fail to teach that the force sensor is in contact with the inner side of the chain, the examiner points to fig. 1 of Kaneko et al. and fig. 1 of Searle.

In response to applicant's arguments that the references fail to teach a human powered apparatus, the examiner points to the abstract of Searle.

Applicant further appears to argue that applicant's sensing wheel (10) is the actual force sensor. With reference to all of the figures and the specification, the actual force sensor is understood to be indicated by the block (30,130). The claims have been treated in the same manner (see claims 5, 6, and 11 for example). The examiner suggests rewording the claim limitations of the "transverse force sensor" and "force sensor" to more clearly link the claimed structure to that shown in the drawings and described in the specification.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS IRVIN whose telephone number is (571)270-3095. The examiner can normally be reached on M-F 10-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on (571) 272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bradley T King/

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Primary Examiner, Art Unit 3657

/Thomas Irvin/  
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